### APPENDIX I

# REFERENCES USED TO DEVELOP THE TRAMAN

**NOTE:** Although the following references were current when this TRAMAN was published, their continued currency cannot be assured. Therefore, you need to be sure you are studying the latest revision.

#### Chapter 1

- Emergency Response Guidebook, DOT P 5800.5, Washington, D. C., 1990 Edition.
- Engineering Operational Sequencing System (EOSS) User's Guide, NAVSSES EOSS Form, Naval Ships Systems Engineering Station, Philadelphia, Pa., May 1989.
- Engineering Trial Report, Transmittal Letter, OPNAV Form 9094/1A, SN 0107-LF-090-9405, Chief of Naval Operations, Washington, D.C., May 1979.
- Engineering Trial Report, Trial Data (Gas Turbine Driven Ships), OPNAV Form 9094/ID, Sheet 1 of 2, SN 0107-LF-090-9440, Chief of Naval Operations, Washington, D. C., May 1979.
- Engineering Trial Report, Trial Data (Gas Turbine Driven Ships), OPNAV Form 9094/1D, Sheet 2 of 2, SN 0107-LF-090-9445, Chief of Naval Operations, Washington, D. C., May 1979.
- Full Power and Economy Trial Requirements For Non-Nuclear Surface Ship Classes, OPNAVINST 9094.1A, Enclosure (1), Chief of Naval Operations, Washington, D.C., November 1988.
- Naval Sea Systems Technical Manual, SL101-AA-GYD-010, "Energy Conservation (Fuel Economy) Shipboard Application," Naval Sea Systems Command, Washington, D. C., 19 April 1988.
- Naval Sea Systems Technical Manual, S9221-C1-STM-010, "Main Boiler Repair and Overhaul Manual," Naval Ships Systems Engineering Station, Philadelphia, Pa., 25 February 1991.
- Naval Sea Systems Technical Manual, S9221-D2-MMA-010, "Steam Generating Plant Inspections (Non-nuclear)," Naval Sea Systems Command, Washington, D. C., 01 October 1990.
- Naval Sea Systems Technical Manual, S9517-AS-OMI-010, "Waste Heat Auxiliary Boilers; Installation, Operation, Maintenance, and Repair," Naval Sea Systems Command, Washington, D.C., 15 July 1992.
- Naval Ships' Technical Manual (NSTM), NAVSEA S9086-C4-STM-000, Chapter 094, 'Trials," Naval Sea Systems Command, Washington, D.C., 01 March 1978.
- Naval Ships' Technical Manual (NSTM), NAVSEA S9086-GX-STM-020, Chapter 220, Volume 2, "Boiler Water/Feedwater Test and Treatment," Naval Sea Systems Command, Washington, D.C., 15 November 1992.

- Naval Ships' Technical Manual (NSTM), NAVSEA S9086-GY-STM-010, Chapter 221, "Boilers," Naval Sea Systems Command, Washington, D.C., 15 September 1992.
- Navy Environmental and Natural Resources Program Manual, OPNAVINST 5090.1A, Chapter 17 (Pollution Abatement Afloat), Chief of Naval Operations, Washington, D.C., 02 October 1990.
- Navy Occupational Safety and Health (NAVOSH) Program Manual For Forces Afloat, OPNAVINST 5100.19B, Chapter B3, Appendix B3-A, Chief of Naval Operations, Washington, D.C., April 1989.
- Standard Organization and Regulations of the U.S. Navy, OPNAVINST 3120.3213, Chapters 5 and 6, Chief of Naval Operations, Washington, D.C., 26 September 1986.

#### Chapter 2

- Corrosion Control Manual for DD-963 Class Ships, NAVSEA S9630-AB-MAN-010, Naval Sea Systems Command, Washington, D.C., January 1985.
- Internal Inspection and Evaluation of Marine Gas Turbine Engines (Model LM2500), NAVSEA S9234-Dl-GTP-010/LM2500, Naval Sea Systems Command, Washington, D.C., April 1985.
- Model 104 Gas Turbine Generator Set, Volume 2, Part 1, S9234-BC-MMO-020/Mod. 104 GTGS, Naval Sea Systems Command, Washington, D.C., December 1982.
- Model 104 Gas Turbine Generator Set, Volume 2, Part 1, S9234-B3-MMO-020/Mod. 139 GTGS, Naval Sea Systems Command, Washington, D.C., December 1982.
- Naval Ships' Technical Manual (NSTM), NAVSEA S9086-HC-STM-000, Chapter 234, "Marine Gas Turbines," Naval Sea Systems Command, Washington, D.C., August 1988.
- Naval Ships' Technical Manual (NSTM), NAVSEA S9086-VD-STM-003, Chapter 631, "Preservation of Ships in Service (Surface Preparation and Painting)," Naval Sea Systems Command, Washington, D.C., December 1987.
- Naval Ships' Technical Manual (NSTM), NAVSEA S9086-VG-STM-010, Chapter 634, "Deck Coverings," Naval Sea Systems Command, Washington, D.C., April 1991.
- Navy Occupational Safety and Health (NAVOSH) Program Manual For Forces Afloat, OPNAVINST 5100.19B, Chapter 6, Chief of Naval Operations, Washington, D.C., April 1989.
- Propulsion Gas Turbine Module LM2500, Volume 2, Part 1, Revision 1, NAVSEA S9234-AD-MMO-030/LM2500, Naval Sea Systems Command, Washington, D.C., September 1991.
- Propulsion Gas Turbine Module LM2500, Volume 2, Part 2, Revision 1, NAVSEA S9234-AD-MMO-040/LM2500, Naval Sea Systems Command, Washington, D.C., September 1991.

Propulsion Gas Turbine Module LM2500, Volume 2, Part 3, Revision 1, NAVSEA S9234-AD-MMO-050/LM2500, Naval Sea Systems Command, Washington, D.C., September 1991.

#### Chapter 3

- Naval Ships' Technical Manual (NSTM), NAVSEA S9243-A7-MMA-010/77842, "Stern Tube Seal," Naval Sea Systems Command, Washington, D.C., 14 April 1989.
- Naval Ships' Technical Manual (NSTM), NAVSEA S9244-AT-MMA-010, "Propulsion Line Bearing, Oil Disc Lubricated," Naval Sea Systems Command, Washington, D.C., 14 April 1989.
- Naval Ships' Technical Manual (NSTM), NAVSEA S9086-HN-STM-010, Chapter 244, "Propulsion Bearings and Seals," Naval Sea Systems Command, Washington, D.C., 31 July 1991.
- Naval Ships' Technical Manual (NSTM), NAVSEA 0901-LP-420-002, Chapter 9420, "Propulsion Reduction Gears, Couplings, and Associated Components," Naval Sea Systems Command, Washington, D.C., 15 August 1985.
- Naval Ships' Technical Manual (NSTM), NAVSEA 0901-LP-430-0012, Chapter 9430, "Shafting, Bearings, and Seals," Naval Sea Systems Command, Washington, D.C., 15 August 1985.
- Propulsion Plant Manual, "Propulsion Plant System for CG-47 Class Ships," Volume 1, S9234-D8-GTP-010/CG-47 PPM, Naval Sea Systems Command, Washington, D.C., 15 December 1990.
- Propulsion Plant Manual, "Propulsion Plant System for DDG-51 Class Ships," Volume 1, S9234-GA-GTP-010/DDG-51 PPM, Naval Sea Systems Command, Washington, D.C., 1 February 1991.
- Propulsion Plant Manual, "Propulsion Plant System for FFG-47 Class Ships," Volume 1, S9234-BL-GTP-010/FFG-47 PPM, Naval Sea Systems Command, Washington, D.C., 15 January 1992.

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